



## UZ2085

## LINEAR INTEGRATED CIRCUIT

### 3A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR

#### DESCRIPTION

The UTC **UZ2085** series are low dropout three-terminal regulators with 3A output current capability. These devices have been optimized for low voltage applications including VTT bus termination in which transient response and minimum input voltage are critical.

Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal limitation provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

#### FEATURES

- \* Fast transient response
- \* Low dropout voltage at up to 3A
- \* Load regulation: 0.05% typical
- \* Trimmed current limit
- \* On-chip thermal limiting
- \* Ultra low current consumption (0.35mA typ.)
- \* Ultra low Adjustment Current (7µA typ.)
- \* Ultra low minimum Load (0.3mA typ.)
- \* Stable with low ESR ceramic output capacitor (MLCC)

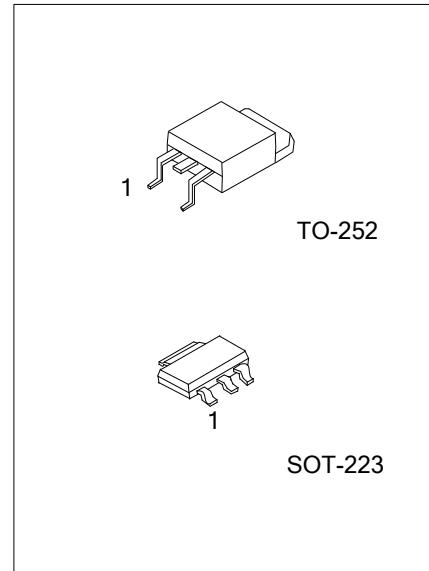
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UZ2085L-xx-AA3-R	UZ2085G-xx-AA3-R	SOT-223	A/G	O	I	Tape Reel
UZ2085L-xx-TN3-R	UZ2085G-xx-TN3-R	TO-252	A/G	O	I	Tape Reel

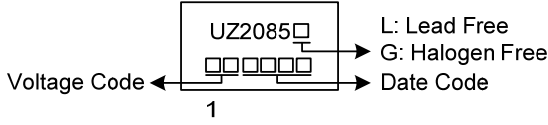
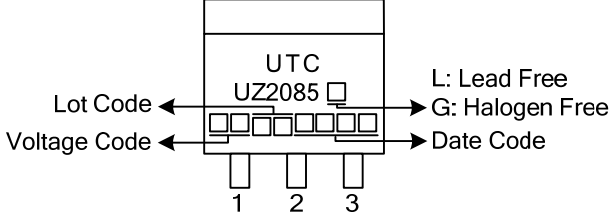
Notes: 1. xx: Output Voltage, refer to Marking Information.

2. A: ADJ (for adjustable regulator), G: GND (for fixed regulator), O:  $V_{OUT}$ , I:  $V_{IN}$

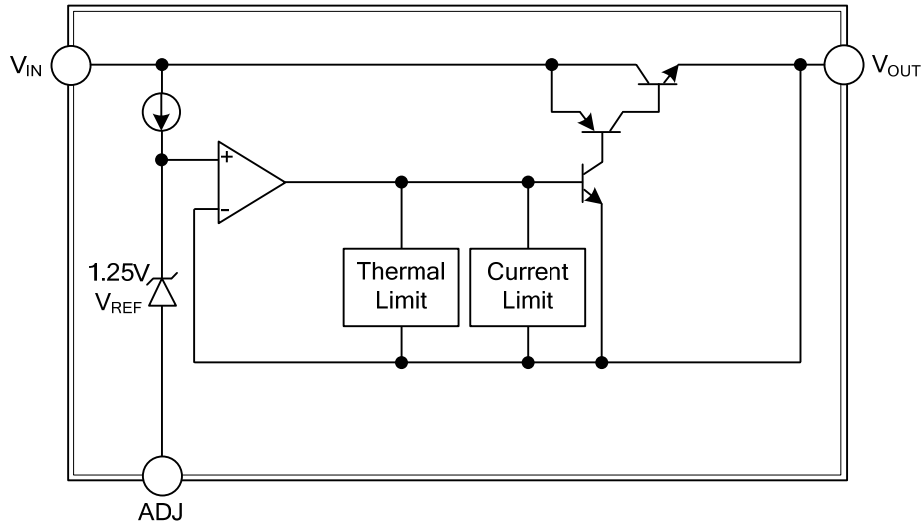
	<p>(1) R: Tape Reel</p> <p>(2) AA3: SOT-223, TN3: TO-252</p> <p>(3) xx: Refer to Marking Information</p> <p>(4) G: Halogen Free and Lead Free, L: Lead Free</p>
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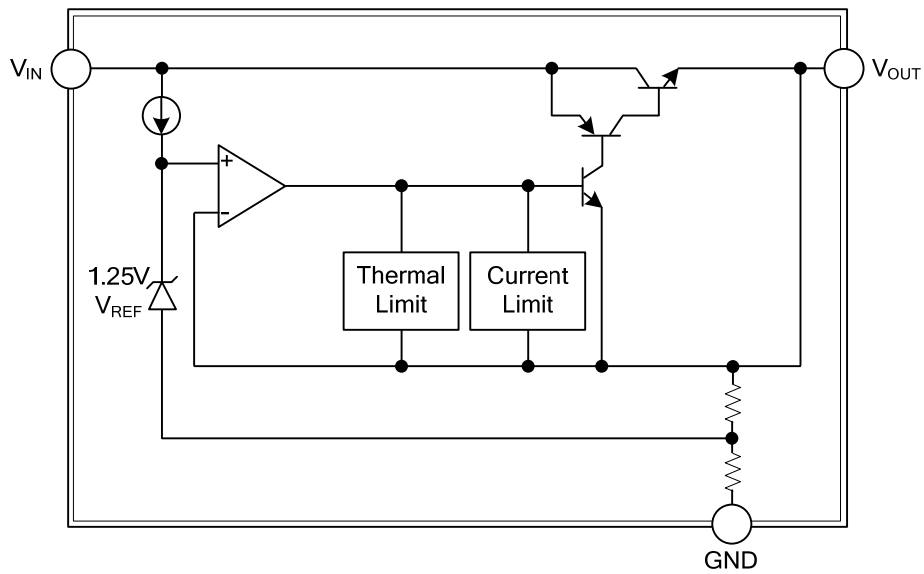
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-223	50:5.0V AD:ADJ	 <p>UZ2085 □ □ □ □ □ □ □ Voltage Code ← → L: Lead Free → G: Halogen Free → Date Code 1</p>
TO-252		 <p>UTC UZ2085 □ Lot Code ← → L: Lead Free → G: Halogen Free Voltage Code ← → Date Code 1 2 3</p>

## ■ BLOCK DIAGRAM



For Adjustable Voltage



For Fixed Voltage

## ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	18	V
Power Dissipation	$P_D$	Internally Limited	W
Junction Temperature	$T_J$	+150	°C
Operating Temperature	$T_{OPR}$	-20 ~ +85	°C
Storage Temperature	$T_{STG}$	-40 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	SOT-223	$\theta_{JA}$	170	°C/W
	TO-252		118	°C/W
Junction to Case	SOT-223	$\theta_{JC}$	20	°C/W
	TO-252		12	°C/W

## ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , $C_{OUT}=22\mu\text{F}$ , unless otherwise specified.)

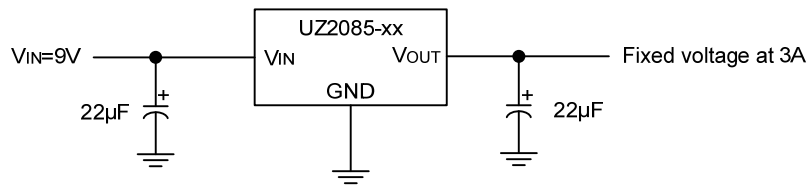
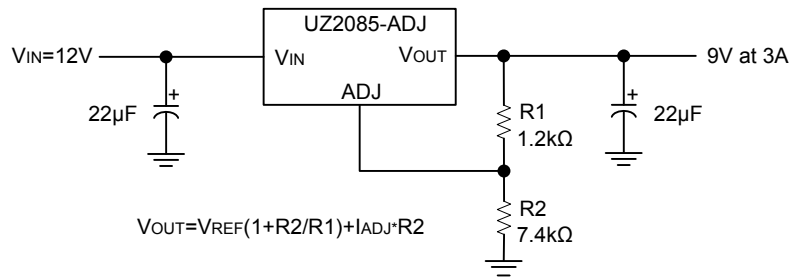
### For UZ2085-ADJ (Adjustable)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	$V_{REF}$	$1.5V \leq (V_{IN} - V_{OUT}) \leq 8.25V$ $10mA \leq I_{OUT} \leq 3A$	1.225	1.25	1.275	V
Line Regulation	$\Delta V_{OUT}$	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $I_{OUT} = 10mA$		0.005	0.2	%
Load Regulation	$\Delta V_{OUT}$	$(V_{IN} - V_{OUT}) = 3V$ , $10mA \leq I_{OUT} \leq 3A$		0.05	0.5	%
Dropout Voltage	$V_D$	$\Delta V_{REF}\% = 1\%$ , $I_{OUT} = 3A$		1.2	1.40	V
Current Limit	$I_{LIMIT}$	$(V_{IN} - V_{OUT}) = 2V$	3.1	5.8		A
Adjust Pin Current	$I_{ADJ}$			7	10	$\mu\text{A}$
Adjust Pin Current Change	$\Delta I_{ADJ}$	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $10mA \leq I_{OUT} \leq 3A$		0.3	2	$\mu\text{A}$
Minimum Load Current	$I_{O(MIN)}$	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$		0.3	1	mA
Ripple Rejection	RR	$f = 120\text{Hz}$ , Tantalum, $(V_{IN} - V_{OUT}) = 3V$ , $I_{OUT} = 3A$	75			dB
Thermal Regulation		$T_A = 25^\circ\text{C}$ , 30ms pulse		0.004	0.02	%/W
Temperature Stability	$\Delta V_{OUT}$			0.5		%
Long-Term Stability	$\Delta V_{OUT}$	$T_A = 125^\circ\text{C}$ , 1000hr		0.03	1.0	%
Output Noise(% of $V_{OUT}$ )	$e_N$	$T_A = 25^\circ\text{C}$ , $10\text{Hz} \leq f \leq 10\text{kHz}$		0.003		%
Thermal Shutdown				150		°C

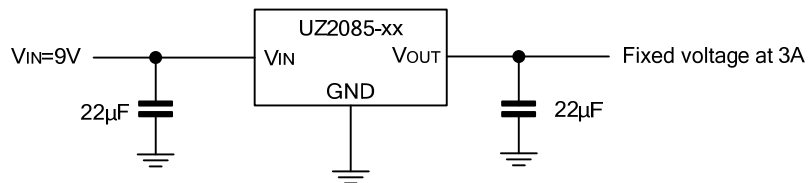
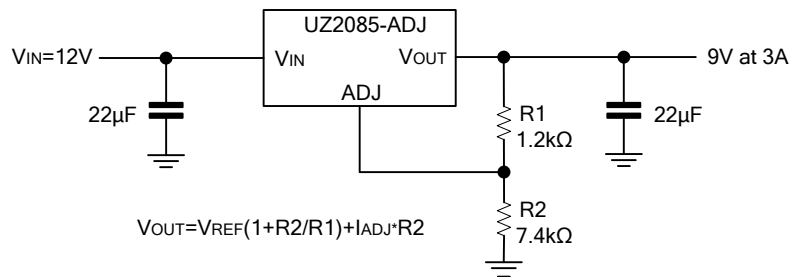
### For UZ2085-xx (Fixed Voltage)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	UZ2085-50 $V_{OUT}$	$6.5V \leq V_{IN} \leq 12V$ , $10mA \leq I_{OUT} \leq 3A$	4.9	5.0	5.1	V
Line Regulation	$\Delta V_{OUT}$	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $I_{OUT} = 10mA$		0.005	0.2	%
Load Regulation	$\Delta V_{OUT}$	$(V_{IN} - V_{OUT}) = 3V$ , $10mA \leq I_{OUT} \leq 3A$		0.05	0.5	%
Dropout Voltage	$V_D$	$\Delta V_{REF}\% = 1\%$ , $I_{OUT} = 3A$		1.2	1.40	V
Current Limit	$I_{LIMIT}$	$(V_{IN} - V_{OUT}) = 2V$	3.1	5.8		A
Minimum Load Current	$I_{O(MIN)}$	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$			1	mA
Quiescent Current	$I_Q$	$V_{IN} = 12V$		0.35	0.5	mA
Ripple Rejection	RR	$f = 120\text{Hz}$ , Tantalum, $(V_{IN} - V_{OUT}) = 3V$ , $I_{OUT} = 3A$	75			dB
Thermal Regulation		$T_A = 25^\circ\text{C}$ , 30ms pulse		0.004	0.02	%/W
Temperature Stability	$\Delta V_{OUT}$	$T_A = 125^\circ\text{C}$ , 1000hr		0.5		%
Long-Term Stability	$\Delta V_{OUT}$			0.03	1.0	%
Output Noise(% of $V_{OUT}$ )	$e_N$	$T_A = 25^\circ\text{C}$ , $10\text{Hz} \leq f \leq 10\text{kHz}$		0.003		%
Thermal shutdown				150		°C

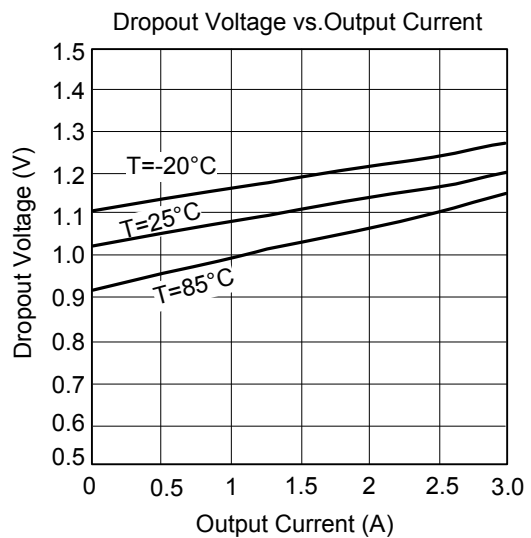
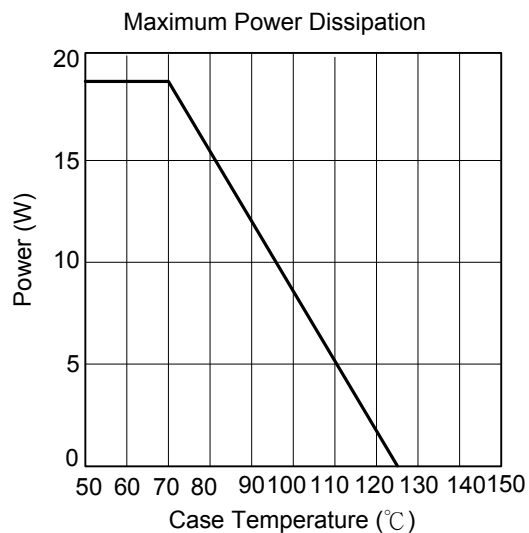
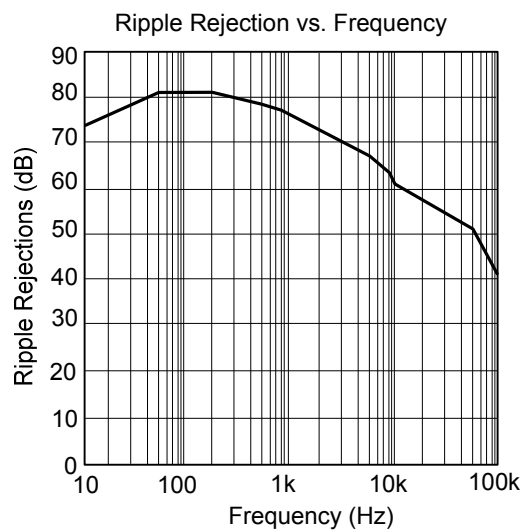
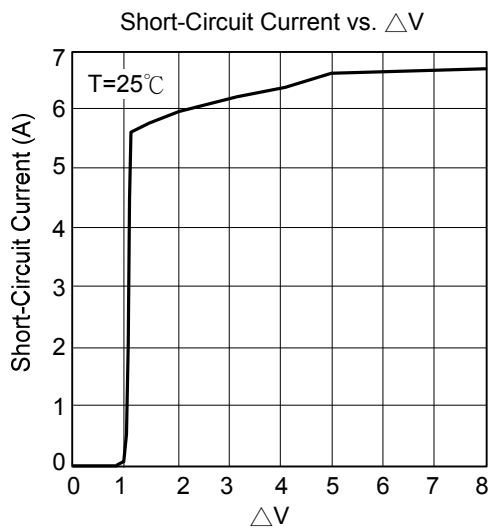
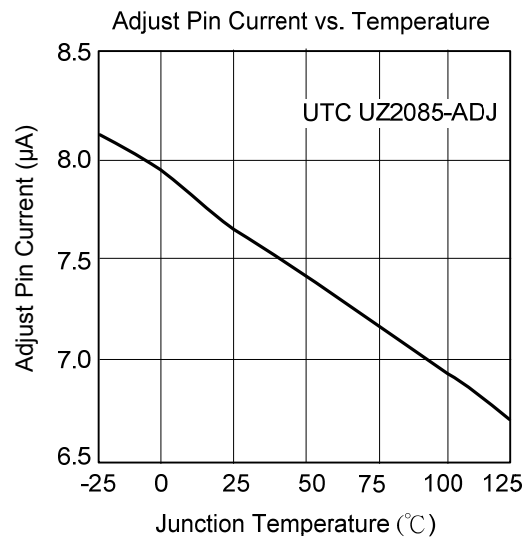
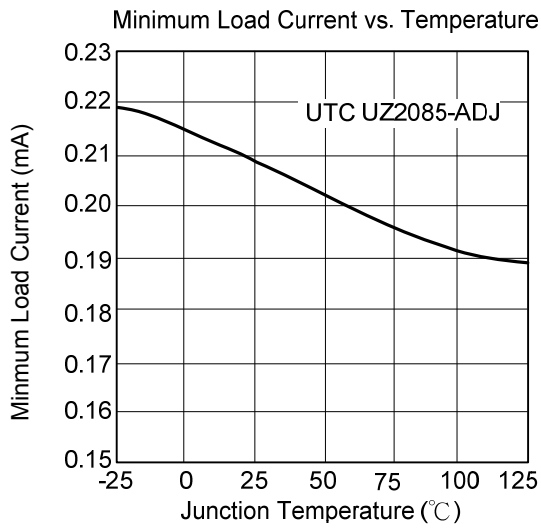
## ■ TYPICAL APPLICATION CIRCUIT



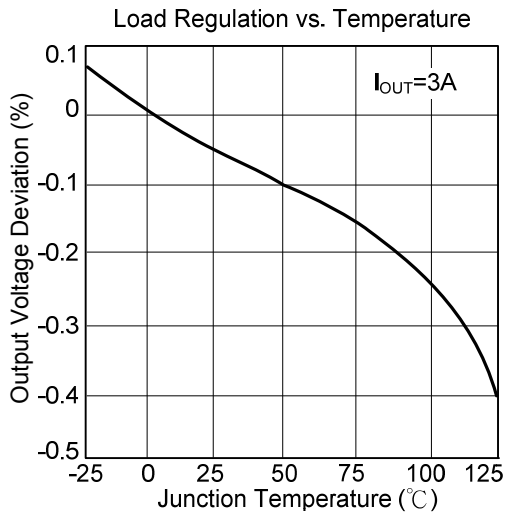
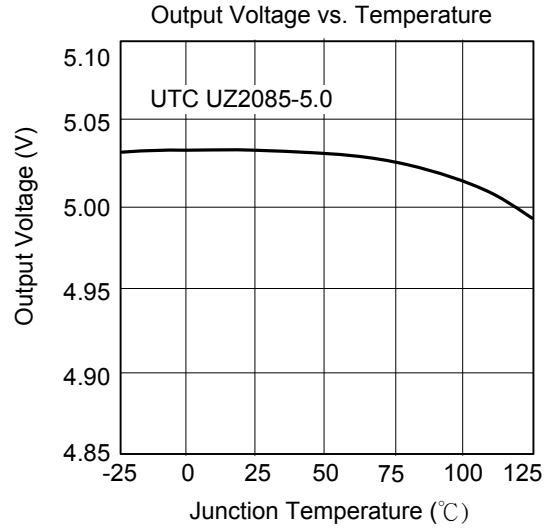
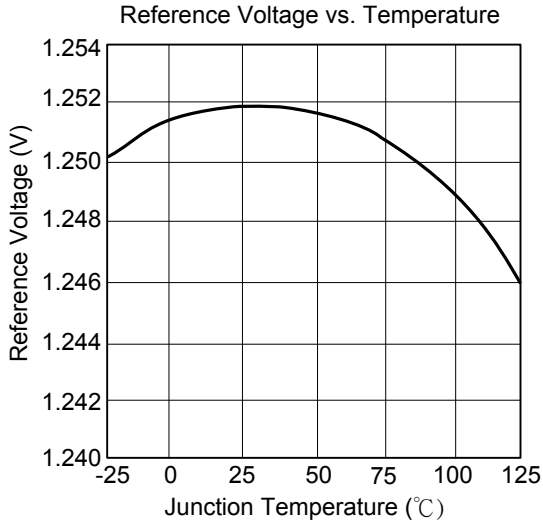
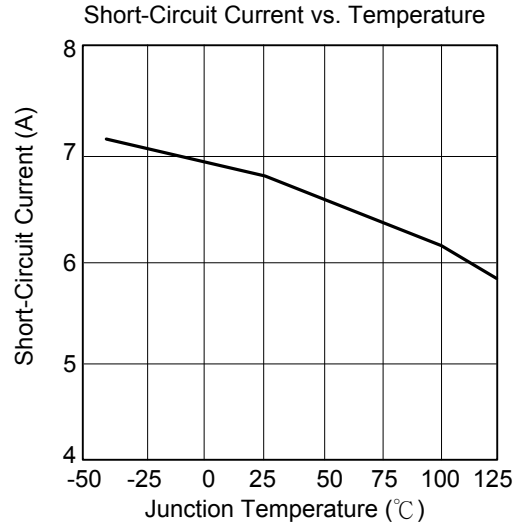
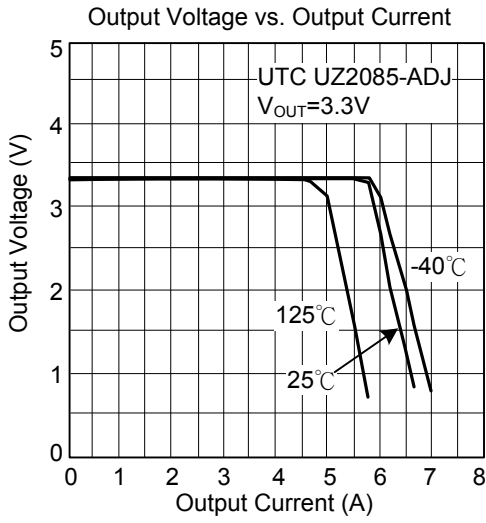
The UTC **UZ2085** also supports MLCC.



## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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